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of  $45^{\circ}$  for the upper truly mountainous regions, where the former method would have made the map illegible. The slopes are represented in the original drawings by the projection of horizontal curves designed to have a difference of level of 10 and 30 metres, according to the scale of  $\frac{1}{10000}$  or  $\frac{1}{100000}$ , from each other. These drawings are then given to the practical limners and engravers, who apply to their translation determined rules of shading.

The execution of this work has been attended by great difficulties, owing both to the nature of the country to be surveyed and the limited means placed at the disposal of the engineers by the Government. In 1832 lightning struck the tent of M. Buchwalder on the top of Mt. Sentis in Appenzell, killing Gobat his assistant, and disabling M. Buchwalder himself for the remainder of the campaign. More recently M. Landsmann was precipitated from a cliff in the Grisons and killed. M. Eschmann ascribes several errors in his measurements to the fact that the accuracy of the level he used might sometimes be altered by the neighbourhood of large mountain masses, and he thought that the freezing of the ground on which the instruments had been left during the night might have altered their position. The engineers are during the summer for months together engaged in conducting their operations at heights of many thousand feet above the level of the sea.

In many mountainous districts, where the engineers most required the assistance of the people to overcome physical difficulties of every kind, the ignorant inhabitants were so much averse to having their own country surveyed, that they at first destroyed the signal stations and scarcely allowed the engineers to proceed with their work. Some of the cantons have, however, been prevailed upon to have the survey of their districts made on a larger scale, so that the results have only to be reduced to the scale of  $\frac{1}{100000}$  for the purposes of the map. In such case, when the canton has no private staff of its own, the work is executed by the Federal engineers, one-third of the expense being defrayed from the funds allowed to the Federal Survey and the remainder by the Cantonal Government.

4. *Sketch of Hilly Daghestan, with the Lesghi Tribes of the Eastern Chain of the Caucasus.* By BARON DE BODE.

Communicated by THOMAS HODGKIN, M.D., &c.

*Read, March 26, 1860.*

IF you take up a map of the Caucasus, you will find that, bordering on the western shores of the Caspian, are the territories of the Shamál of Terki and the possessions of the Kazi-Kámúks and Mehti-Kúli tribes.\* They all lie east of the highlands with which we have now to deal, which extend to the north of the great chain. Unlike the other alpine regions of the Caucasus, split into hill and dale, with spurs and offshoots from the principal snowy range, Daghestan† offers a singular aspect of stupendous granite masses, forming a high table-land, intersected by rapid streams, the three Kòi-sus,‡ with their respective tributaries, embedded in deep ravines whose steep walls descend terrace-like to the water's edge. The greater part of these granite hills are void of vegetation, and look wild and dreary.

Agriculture is in a most deplorable state. You may often see some hardy

\* These districts lie between Derbend and the Terek. See Monteith's map of Georgia.—J. S.

† Daghestan has been generally considered as mountainous with very narrow valleys.—J. S.

‡ Turkish words—Kioi, a village, soo, water.—J. S.

mountaineer, with a few handfuls of wheat in a bag attached to his waist, a musket slung over his shoulder, and a dagger in his belt, climbing up some steep rock, by the aid of a crook and a rope, in quest of a patch of vegetable soil wherein to deposit the grain. Nor can the cattle find much to graze upon on those naked granite heights. The scanty grass that springs up early in the year is soon parched by the scorching sun of summer; and when winter sets in, the whole face of nature on this high table-land is covered with a uniform sheet of snow several feet in depth.

This peculiar sterility of nature has prompted the inhabitants to attend more particularly to the erection of terraced gardens, and it must cost them much labour and some degree of skill to lay them out on the brink of precipices. They also select the least accessible points to erect their dwellings, which, like eagles' nests, are seen perched against some craggy rocks. For want of space, their houses—all built of freestone—crowd one above the other, spreading at times in the form of an amphitheatre, with turrets, crenelled walls, and other means of defence, every village constituting a fortress in itself.

Roads there are none, and the narrow footpaths used by the mountaineers can scarcely be available for beasts of burden. This is not a very prepossessing picture of Daghestan, but such are the outlying and principal features of this land.

Nor are the moral features of the people less characteristic. Wild as the scenes that surround them, with an indomitable spirit and a passion for independence, the Lesghi are sober by necessity as well as by habit. There is a restless, lurking fierceness about the eyes which he can ill conceal, and which conveys a disagreeable expression to his whole physiognomy. In this respect the deportment of the Cherkess is nobler and far more prepossessing: there is a degree of open frankness which suits so well with his tall yet slender form. The Lesghi is more hidden in his movements, with something of the feline species in his nature. It is not unlikely that his political position, surrounded by enemies within and without, has much to do in developing these characteristics, as he is ever on the alert against surprise, while his own predatory habits teach him caution and dissimulation. Comparing him with the *Lek* tribes of the highlands of Persia, I am also inclined to give the preference to the latter as to external appearance. He may be more swarthy and decidedly blacker than the highlander of Daghestan, but he has a more ruddy complexion; the Lesghi looks sallow and careworn. I do not recollect to have met with any blue eyes among them, although in general their hair appears of a lighter colour than that of their Persian or Cherkess neighbours. And may not this peculiarity be accounted for by the localities they occupy? We have seen that the high table-land of Daghestan is covered with deep snow part of the year, to which the Cherkess are less exposed, and the *Lár* and *Lek* tribes of Persia are perfectly exempt: for they quit their cool ey laks or summer encampments as soon as the cold commences, and descend into the more genial plains below.

The Lesghi also come down at times into the plains, but less with a view of tending their sheep than that of plunder. They come peering down as a mountain avalanche, carrying terror and dismay before them, and leaving destruction and desolation behind. I recollect, some years ago, when returning from Persia, instead of following the beaten track I struck into the hilly Daghestan, and then entered the plain of the Kúmúks and Nogai Tatars.\* On stopping to rest one night at the foot of Kazi-Yúrt, on the river Súlak, I was struck by an unusual display of hurry and bustle in and around the place, and learnt that information had just been obtained that a party of Lesghi, with Shamyl at their head, had left the hills and were in hot pursuit

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\* South of, and some miles from, the Terek.—J. S.

of plunder in the plain. Next morning I found that the Kúmúks and Nogai Tatars had sought shelter round the fort, and pitched their tents under the range of the cannon of Kazi-Yúrt, the commandant of which came to announce the unwelcome intelligence that he could not allow me to continue my journey until the coast was clear, namely, as soon as a sufficient number of Cossacks had been collected from the different posts of the cordon-line to force the marauders back into their fastnesses.

My captivity lasted but a few days, of which I had nothing to regret, as I spent it in the pleasant company of the commander of the fort and his good lady, Mr. and Mrs. Bibikoff. The exposed station this distinguished young officer occupied was by no means a sinecure. He had to be constantly on the watch against any sudden attacks of the enemy, and soon after arriving at St. Petersburg the melancholy report reached me that he had fallen a victim to the sword of the enemy. What became of his poor wife, I am ignorant. A short time previous to my visit, the post-stations which had been established between Kazi-Yúrt and the town of Kislár, on the banks of the Terek, leading to Astrakhan, had been destroyed, the postilions killed, and the horses carried away into the mountains, so that I had to hire my cattle from the soldiers of the garrison to take me as far as Kislár, some hundred miles distant. But how could I evince any misgivings for my safety, when I had for my guide on the coach-box of a very primitive sort of vehicle, with three horses abreast, the wife of one of the garrison men,—the high-spirited and intrepid Maria Parlovna? Indifference to danger is often the result of habit, and I have had occasion more than once to witness the wives, sisters, and daughters of the military men in the Caucasus, even mothers, evince a degree of courage and composure in moments of danger, of which one would suppose them incapable if they were less accustomed to look danger in the face. This reminds me of an instance of which I was a witness in the very localities through which we are at present threading our way, and which I may venture therefore to relate as being in harmony with the couleur locale.

When in the heart of the Daghestan Mountains, I visited a fort which had lately been erected on the Súлах to keep in check a rather turbulent Lesghi aúl or village some thousand families strong, and who were far from being reconciled to their present lot. In order to show me the lions of the place, my hospitable host proposed taking a ride to the village, which was at some distance. Several young officers of the garrison volunteered to be of our party; but I was rather surprised, when the son of the commandant—a mere boy of nine or ten years old—expressed a wish to accompany us, that his mother readily acceded to his request. I do not undertake to affirm whether the maternal heart felt as much composed as the outward features of the countenance seemed to imply, but the veteran major was evidently pleased both with the mother and the son. We crossed the Súлах by a stone bridge thrown over the deep ravine through which the river winds its impetuous course, and threaded up a steep ascent, having to our right and left hanging gardens enclosed between high stone walls,—Cherkey is known for its vineyards. On reaching the platform on the summit we were soon surrounded by the male population of the village, with countenances anything but prepossessing. We then begged leave to see the interior of some of their sakli or houses, to which they conducted us rather reluctantly. As we entered, the women receded into the interior apartments; only some children, with very expressive eyes, stared at our intrusion. The greater part of the aúl was in a dilapidated state; many of the houses—mostly of slate, sandstone, and boulders—had crumbled by the effect of the cannon when the place had been reduced to obedience, but the inhabitants had not yet had the leisure or the heart to rebuild their dwellings.

On returning to the maidan or open square, we found the villagers in rather

an excited state, and inquired into the cause. They pointed with their fingers to a steep mountain at some distance, from the heights of which proceeded a dense cloud of smoke or dust, with some figures running to and fro.

Was it a razzia contemplated by a neighbouring aul or tribe to avenge some deadly feud on the devoted heads of the Cherkey inhabitants, now fallen from their high estate? or was it a fanatical party of Múrids, friendly to the people of the place, hurrying to glut their vengeance on the blood of Christians? The Cherkey people were armed with long muskets and daggers,—in fact, the mountaineers never quit their arms. So were we armed; and before the matter could be cleared up we were determined to stand our ground; but we exchanged looks of significance, and it was then that I admired our little companion for his self-composure; at all events he evinced no signs of fear,—perhaps, like Nelson, he had never seen fear. When the cloud dispersed, it turned out that a party of the Cherkey had attacked some of their enemies and carried off a whole flock of sheep, which they were bringing in triumph to their friends.

After all, the adventure proved rather of a Quixotic nature; but it might have been different, and, instead of laughing, as some did, at the absurd occurrence, the inhabitants of Cherkey might have had the laugh at our expense.

In order to give you a clearer insight into the different communities of the hilly Daghestan, and which, after all, can only be an outline, it will better serve our purpose if I name first the principal tributaries of the Súlakh river, which all have their sources in the great chain of the Caucasus; as in so doing I can more easily group these highland clans. Thus, the Koî-Sú, passing through the territories of the Andí, on the western frontier, bears that name; the Koî-Sú, next in succession to the east of the former, traverses the country of the Avars, and is styled the River of the Avars; and lastly, the Koî-Sú coming in the direction of the Kazi-Kúmúks, together with the Kara-Sú, one of its tributaries, forms the eastern boundary of the hilly Daghestan.

All these mountain streams serve to swell the volume and increase the impetuosity of the Súlakh, which flows into the Caspian in the possessions of the Shamkhal of Terki.

The first on the list is the community of the Deedo, who inhabit the almost inaccessible heights from whence the Koî-Sú of the Andí gathers its tributary waters from the great snowy range of the Caucasus. It is only two years ago that the Russian General Baron Vreosky succeeded in penetrating into the recesses of their mountains and opened a line of communication with Kúpro, the principal stronghold of these wild and unruly people. It is rather an interesting fact that, among the ancient tribes enumerated by Ptolemy, you meet with the *Αιδουροι* in the neighbourhood of the *Τουσχοι*, the present Tushins, who occupy the Caucasus west of the Deedo tribe.

There exists a curious legend among them, which is mentioned also in the old Georgian chronicles. At the time, it is said, when Alexander of Macedon besieged the town of Mzheth, the ancient capital of Georgia, the natives, after the siege had lasted about eleven months, feeling unable any longer to defend the place, found means of escape by boring a passage through the mountains, owing to the soft texture of the stone, and sought refuge in the country of Deedófi.

Next to the Deedo, along the line of the great chain in the upper course of the Koî-Sú of the Avars, live scattered among the rocks the Antkratl tribes, joined into one confederacy, although broken into numerous small communities, of which it would be fastidious to attempt the enumeration: Tosh, Antzùkh, and Kapucha may be reckoned among the more prominent. Agriculture, as elsewhere in these hills, is carried on on a very small scale. According to Russian prisoners, who have dwelt some time among them, the space of

land a Russian peasant is able to plough in the course of one day is made to suffice a Lesghi family all the year round.

The language spoken here is partly the dialect in use among the Avars (of whom we will speak presently) and partly the Georgian. It may be here observed that the clans have each their different jargons, which are said, however, to spring from one common stock. Klaproth divides the Lesghi language into four principal dialects, but it is to be regretted that the subject has not yet been sufficiently studied.

The country of the Avars lies between the two Koï-Sú of Andí on the west, and the river of the Avars on the east, and although watered by many streams is but poorly cultivated. The inhabitants sow barley, oats, and millet. They dry their wheat, then bruise it, and, after roasting, mix it up with honey and make biscuits thereof, which they take with them on their military excursions, as it is found to be very light and nutritive. We find mention of the Awyr in the ancient Zend text among the inhabitants of the Caucasian mountains. The Avars are sometimes confounded with the Huns and even the Pechunghs. Klaproth finds a great resemblance between the personal nouns among the Huns and the Avars of Hunzah; and, among others, that of Attila or Addilla, which, he says, is a very common name with the Avars of the present day. "Adil," the "Just," in Persian, is sometimes added to that of their chiefs, though God only knows how far they deserve that epithet. The Avars figure largely in the annals of the middle ages, and formed a strong power after the Arabs had converted them to Islam, and up to the present time they are the greatest fanatics among the Mussulman tribes of the Caucasus. But the country of the Avars, and Hunzah, their capital, have become more familiar to the European ear by the novel of Merlinsky, 'Amúlat-Beg,' the English version of which may be found in 'Blackwood's Magazine' for the year 1842.

Klaproth, seeking for analogies between the language of the Avars and the dialects spoken by the natives of Northern Siberia, mentions, among others, that the word *mother*, in the Avar tongue, is *ebel*; with the Ostiaks, *ewel*; among the Samoyeds, *ewel* and *ewya*.

But we may here observe that, among many of the Eastern tribes, the names of Adam and Eve have been retained (of course, with inevitable variations), and usually serve to designate man and woman or mother.

To the north of the Avars we meet the Andí, the country of Gúmbet, and the Koï-sú-bú, which, for fear of detaining us too long, we will dismiss with a passing remark, that the former are good tillers of the land, evince great aptitude in the manufacture of woollens, and show some disposition for trade,—a happy feature which, if it were more generally cultivated among the yet rude mountaineers, would more easily bring about the much-desired peaceful relations between the present masters of the Caucasus and the native tribes of the mountains.

The country west of the Súlahk bears the name of Salataú. It is very hilly, with deep and hollow ravines, but rich in pasture-land and very woody. The vine can be raised with success. We have had occasion to mention already the vineyards of the Cherkey people on the banks of the Súlahk. Although the hills rise in some parts to the height of nearly 8000 feet, the climate is genially warm in the valleys, which produce peaches, and where rice is cultivated.

Salataú has some very fine hot sulphurous springs, which, in all probability, will be better frequented when greater security shall be established throughout this land. The country is also rich in flocks of sheep. It is mostly this portion of Daghestan which has been the theatre of the bloody struggles between the Russian forces in the Caucasus and the Lesghi highlanders, and their strongholds have gradually fallen into the hands of the former.

Thus, Gumri, where Kazi-Mullah, the prophet and mountain chief, fell in 1832, was followed by Ahúlko, Dango, and recently Veden, which have successively been abandoned by Shamyl and garrisoned by Russian troops.

In closing my narrative I wish you to understand, my dear Doctor, that not all of it is the result of my own personal observations. I have been essentially aided in this sketch by consulting the materials which have been collected on this interesting branch of ethnography by Mr. Berger, whose position in that part of the world has enabled him to gather correct data about the mountain tribes of the Caucasus, and who, I hope, will not slacken in his praiseworthy efforts of raising the veil which covers many a part of Daghestan, and dispelling the mist still brooding over the hilly regions of the East, fraught with so much interest to the inquiring ethnologist.\*

5. *Address to the Geographical and Ethnological Section of the British Association at the Oxford Meeting of 1860.* By its President, SIR RODERICK IMPEY MURCHISON, D.C.L., F.R.S., Vice-President of the Royal and Royal Geographical Societies, and Director-General of the Geological Survey of the United Kingdom, &c.

LADIES AND GENTLEMEN,—During the last two years only, the President of each Section of the British Association having usually opened the business of the Meeting by a short address, it fell to my lot to offer a few words to the geographers and ethnologists who were assembled at Leeds in 1858. I there expressed the satisfaction I felt in proposing, at the Edinburgh Meeting in 1850, the formation of a separate Section for Geography and Ethnology, to occupy the place left vacant by our Medical Associates who had seceded to found an association of their own.

Until that year geography had been attached exclusively to the Geological Section, in which it was almost submerged by the numerous memoirs of my brethren of the rocks, whilst Ethnology, forming a Sub-Section, with difficulty obtained a proper place of meeting. Now, however, both these sciences are, I am happy to say, fully represented; and I trust that the result of the coming week will show, that the subjects to be illustrated will attract so many members to our hall as will prove that Geography, in its comprehensive sense, is as popular in Oxford as it is in the metropolis.

Before I enter upon the consideration of any memoirs which may be laid before us, let me allude to a few of the subjects of deep interest which have been illustrated by British Geographers in various parts of the world in the two years which have elapsed since I had the honour of last presiding over you.

In Africa, the earlier discoveries of that great traveller Livingstone have been followed by other researches of his companions and himself, which, as far as they go, have completely realized his anticipation of detecting large elevated tracts, truly *Sanatoria* as compared with those swampy and low regions near the coast, which have impressed too generally on the minds of our countrymen the impossibility of sustaining a life of exertion in any intertropical region of Africa. The opening out of the Shiré river, that grand affluent of the Zambesi, with the description of its banks and contiguous lofty terraces and mountains, and the discovery of the healthfulness of the tract, is most refreshing

\* Since these lines were penned, the military operations on the left flank of the Caucasus have been carried on with so much success by the present General-in-Chief, Prince Bariatinsky, that Daghestan has surrendered to the power of Russia.